Historical Ecology of the Monterey Bay National Marine Sanctuary (MBNMS). Phase 1. Creation of Historical Source Database for MBNMS

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Introduction: Historical ecological research is a tool to document the environmental history of an area providing information to resource managers and ecologists that are trying to make sense of current environmental trends occurring in altered ecosystems. Previous studies in historical ecology have shown that historical texts and photographs describing natural resource use and extraction can be helpful in understanding past, present, and future ecological trends, establishing older historical baselines for biodiversity and abundance, and distinguishing human impacts from natural variation. As a result of resource exploitation in MBNMS dating back to pre-European influence (pre 1700s), MBNMS is rich with historical ecological data, ranging from archaeological finds, to journal entries from the first explorers, to newspaper articles from recent periodicals.

This poster presents an ongoing project, initially to compile a comprehensive list of historical accounts and create a searchable database of books, journals, newspaper articles, manuscripts, reports, images and other texts relevant to resource use in the MBNMS. We present a selection of historical evidence that includes anecdotes, photographs and maps.

Methods: To develop a comprehensive catalogue of historical documents, a historical context was researched to establish a list of search terms. By researching a historical context it is possible to create a repeatable list of search terms that might yield the maximum results related to the historical ecology of MBNMS when searching regional databases and catalogues.

Once these terms were chosen, a variety of databases (Fig 2.) were searched using the standardized list of search terms (Fig 1.). The search resulted in over 6,000 records, of which approximately 350 were useful for this project. Those 350 records were divided by media type, assigned properties, and then organized into a searchable, relational database using FileMaker Pro. The database is designed such that the user can search using reference IDs, year, title, keyword, or associated notes. In the results field, information regarding each record is displayed, including the data type, reference code, author, title, year, archive, usage rights, and a short description of the document and associated information.

Fig 1. Catalogue of search terms used to mine archives.

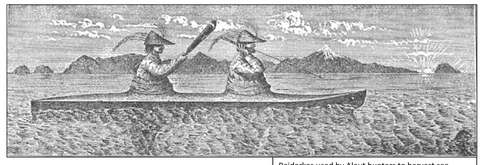
Marine History	Otter
Whale	Fur Trade
Whaling	Monterey
Carmel	Big Sur
Expedition	Voyage
Natural History	Abalone
Fishing	Santa Cruz

Fig 2: Online archives and associated website.

Online Archive of California (OAC)	http://www.oac.cdlib.org/
MELVYL (Catalogue of the University of California Libraries)	http://melvyl.cdlib.org/
Google	http://www.google.com/
Google Scholar	http://scholar.google.com/
Google Books	http://books.google.com/
SOCRATES (Catalogue for Stanford University)	http://jenson.stanford.edu/
ARC (Catalogue for the National Archives)	http://www.archives.gov/research/arc/
SIRIS (Catalogue for Smithsonian Institution)	http://www.siris.si.edu/
JSTOR	http://www.jstor.org/
Internet Archive	http://www.archive.org
New York Times Archives	http://www.nytimes.com/ref/membercenter/nytarchive.html
NOAA Central Library	http://docs.lib.noaa.gov/rescue/Fish_Commission_Bulletins/data_rescue_fish_commision_bulletins.html
NOAA Satellite and Information Service	http://map.ngdc.noaa.gov/website/mgg/nos_hydro/viewer.htm
California Academy of Sciences Library	http://research.calacademy.org/research/library/

Future Research: Currently work is being conducted to map trends of observed abundance within MBNMS over time, and to create an older historical baseline of marine biodiversity and abundance for certain species within MBNMS. These objectives will be met by mining gathered data for anecdotal evidence of biological indicators, which are sorted using a multi-level abundance coding system (Pandolfi et al. 2003; Palomares et al. 2005) to gather quantitative information on marine organisms from qualitative sources such as historical narratives. The coding system assigns perceived abundance of species or a group of species according to words or images used in the historical source to categories: (1) extremely abundant; (2) abundant; (3) very common; (4) common; (5) rare; (6) absent; and (U) unknown (an "occurrence" where no inference on abundance was possible). This coding should be repeated independently by several researchers in order to reduce subjectivity.

Timeline
This timeline presents examples of types of qualitative anecdotal evidence found while creating the MBNMS historical database. This evidence can be assigned a numerical code based on perceived abundance, quantified and correlated with other data to establish historical baselines of abundance.



Baidarkas used by Aleut hunters to harvest sea otters. Typically along the california coast hunters were either trapped on land, shot from the shore, or followed by groups of hunters gradually wearing the animal down. (Photo: The California Sea Otter Trade, 1748-1848, Adele Ogden).

1539
"above 500 whales came athwart of us in 2 or 3 skulles within one houres space, which were so huge it was wonderfull, and some of them came so neere unto the ship, that they swum under the same from one side to another, whereupon we were in great feare, lest they should doe us some hurt."

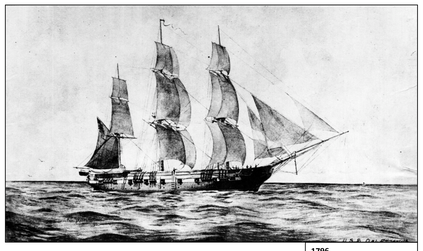
-Fracisco de Ulloa

1602
"Along the coast are great numbers of gulls, cormorants, crows, and other sea-fowl. In the rocks are a great many cavities, some like the matrices of a large shell-fish with conques equal to the finest mother of pearl. The sea abounds with oysters, lobsters, crabs, etc. Also huge sea wolves and whales."

-Sebastian Vizcaino

1602
"This bay also had been already surveyed by the *Almirante* [one of Vizcaino's ships] who gave it the name of Bahia de Belenas or Whale Bay, on account of the multitudes of that large fish they saw there, being drawn thither by the abundance of several kinds of fish."

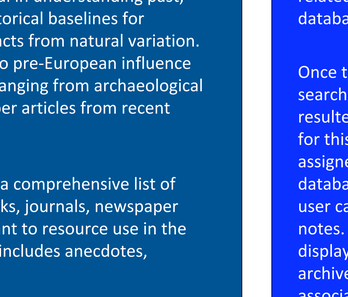
-Sebastian Vizcaino



1796
Illustration of the first American ship to visit Monterey Bay and Engage in the otter fur Trade. (Photo courtesy Dennis Copeland, California Room, Monterey Public Library).

1733
"But the greatest curiosity in this particular, which has been found in California, is a kind of animal exactly resembling a beaver, if not actually a species of that creature….They found such great numbers of them together, that the seamen killed above twenty of them following them only with sticks. Some of the skins of these creatures the father sent to Mexico"

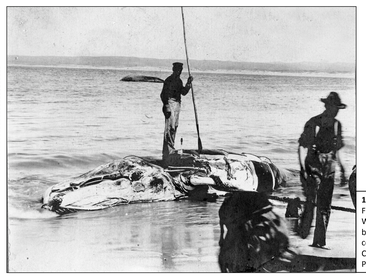
-Miguel Venegas



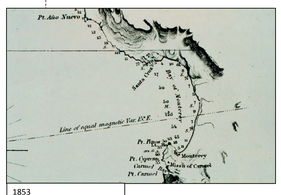
1797
One of the first maps of Monterey Bay Drawn by Jean Francois de Galup de la Perouse. (Photo: David Rumsey Gallery).

1786
"It is impossible to describe either the number of whales with which we were surrounded, or their familiarity. They blowed every half minute within half a pistol-shot from our frigates, and occasioned a most annoying stench."

-Jean Francois de Galup de la Perouse



1985
Flensing a small humpback Whale on a Monterey Bay beach. (Photo: J.K. Oliver, courtesy Dennis Copeland, California Room, Monterey Public Library).



1853
Early chart of Monterey Bay. (Photo: NOAA Office of Coast Survey).

1852
"they spent their time in hunting sea otter, (with which the coast abounds,) beaver, bear and deer. The skins of the sea otter were worth here $40 each, and were purchased for the China trade"

-J.H. Carson

1834
"The roadstead of Monterey is frequented by an innumerable school of humpbacked whales which get very familiar. They come in among the ships anchored in the road where they infect the air… by the penetrating and nauseating odor which they give off.."

-Capt. Abel Aubert du petit-Thouars

1910
A whaler identified as Mike Noon Sitting atop a pile of whale bones. (Photo courtesy Dennis Copeland, California Room, Monterey Public Library).

1875
"Sea otter are very scarce on the coast now, few may be found in the neighborhood of the Sur and on the Santa Barbara Coast, but in the early days, it was the most profitable business a skillful and lucky hunter could embark in."

-Jack Swan

1874
"This peculiar branch of whaling is rapidly dying out, owing to the scarcity of the animals which now visit the coast; and even these have become exceedingly difficult to approach…. It is now next to impossible to 'strike' with the hand harpoon"

-Charles M. Scammon referring to California Shore Whaling

1911
"For the **first time in twenty years**, hunting whales took place in Monterey Bay….He loaded a bomb with barbed wire and old nails, and he dreamed of the smell of the frying whale and the high price of bone and oil."

-Excerpt from the Monterey Daily Cypress regarding the revitalization of whaling by Mike Noon

1938
"The news of the discovery (of sea otters) was telephoned to Monterey, where it was received with skepticism, and Mrs. Sharpe was told that she had confused seals with sea otters, for the latter had disappeared decades ago and had become practically extinct."

-Augustin S. Macdonald

1923
"First: Whaling is so destructive and certain by the present methods that when the gunner of a steam whaler has a fair chance at a whale it is as good as secured. Second: Every part of the whale is used, and the demand for the various products of fertilizer and chicken feed is so good that the part of the whale that was once cast adrift as worthless is now about as valuable as the oil."

-Edwin Starks referring to California Shore Whaling

A California Gray whale (*Eschrichtius robustus*) spy-hops out of the water; a far more common sight before industrialized whaling. Numbers are increasing but carrying capacity of the oceans looks has been impacted that could limit their recovery. (Photo: Wayne Perryman, NOAA/SWFSC).

In 1938 a group of otters were spotted near Bixby Bridge along the Big Sur coast. This documents the first time California sea otters were seen after their virtual extirpation from California, where they were hunted for their pelts. (Photo: William L. Morgan).

1500 - 1700 Pre-European Native Americans

1700 - 1800 Early European Exploration

1800 - 1900 The Beginning of Commercial Marine Resource Use

1900 - 1950 Industrial Fisheries

1950 - 2009 Present Day

1500's
Archaeological excavations Native American middens (refuse sites) at Pescadero Point reveal that sea otters were an important part of Ohlone Indian diets.

1733
Earliest recorded instance of the trade in Sea otter pelts documented by Father Miguel Venegas.

1786
Large-scale hunting of sea otters by Spanish and Russian explorers commences.

1861
Shore Whaling Stations fully established in Half Moon Bay, Pigeon Point, Davenport, Santa Cruz, Moss Landing, Carmel, Point Lobos, and San Simeon.

1868
An estimated 200,000 sea otters taken on the Western Coast since the beginning of hunting.

1905
The introduction of factory ships leads to massive growth in the whaling industry.

1938
A group of 96 sea otters found off the coast of Carmel, CA

1946
International Convention for the Regulation of Whaling signed after regulation began in 1931

1977
Sea otters listed as "Threatened" under the U.S. Endangered Species Act (ESA)